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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/571,266

03/09/2006

Yasushi Sasaki

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KRATZ, QUINTOS & HANSON, LLP
1420 K Street, N.W.
4th Floor
WASHINGTON, DC 20005

EXAMINER

CHAWLA, JYOTI

ART UNIT

PAPER NUMBER

1781

MAIL DATE

DELIVERY MODE

09/28/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,266	SASAKI ET AL.	
	Examiner	Art Unit	
	JYOTI CHAWLA	1781	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 7-19 is/are pending in the application.
- 4a) Of the above claim(s) 10-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7-9 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 11, 2011 has been entered as compliant. Claims 2-6 have been cancelled, claim 1 has been amended and new claims 17-19 have been added in the current application. Claims 1, 7-19 are pending, claims 10-16 remain withdrawn for being directed to non-elected invention and elected claims 1, 7-9, and 17-19 are examined in the current application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were

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made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

A) Claims 1, 7-9, 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Industrial gums by Whistler et al (page 205-235), hereinafter Whistler, in combination with Ikuine et al (JP 2000-166489 and translation), hereinafter Ikuine and Walter et al (US 5476678), herein after Walker.

Evidentiary reference "Particle Size Conversion" Standard sieve sizes obtained from: <http://www.sigmaaldrich.com/chemistry/stockroom-reagents/learning-center/technical-library/particle-size-conversion.html>

Regarding amended **claims 1, 8-9 and claims 17-19**, Whistler discloses heating gum arabic is extremely soluble and can form solutions over a wide range of concentrations at 25°C and this solubility is responsible for excellent stabilizing and emulsifying properties of gum Arabic (See pages 216-217 and table V of Whistler). Whistler also discloses that gum Arabic was known and available in particle sizes 40/100 mesh sizes that are readily dispersible in water (Page 228, Paragraph 4), which falls in applicant's claimed size range for gum Arabic. Further Whistler also discloses heating Gum Arabic in applicant's recited range at least for the purpose of modifying gum Arabic, e.g., on page 214 it is disclosed that heating a 2% solution of gum arabic to about 98°C for 50 hours leads to low viscosity degraded gum arabic product. Similarly page 227-228 discloses water solutions formed with up to 50% gum arabic (As shown in applicant's affidavit). Whistler page 227-228 also discloses that solubility of gum arabic increases as the temperature increases (Page 227 last paragraph). In another example Whistler discloses heating gum arabic solution to 80°C or higher for 1 hour or 100°C for 30 minutes to inactivate enzymes (oxidase and peroxidase), which makes gum arabic more usable with other hydrocolloids such as pectin (See page 233). Thus heating gum

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arabic as such or a solution of gum arabic to increase the miscibility and emulsifying ability was well known at the time of the invention as taught by Whistler. Whistler is silent regarding the modified gum arabic having low loss on drying as claimed being used to form the solution, however, Ikuine discloses a method for producing modified gum arabic (for example see translation, page 4, line 3), the method comprising the step of heating dried gum arabic (for example see translation, page 4, line 3 where Ikuine teaches of heating gum arabic in solid state, i.e., dry or undissolved state), wherein the gum arabic is heated at a temperature of 60-140 °C, (for example, see translation, page 4, lines 10-14) which overlaps applicant's claimed range of 90°C to 180°C (claim 1) and also the narrower range of 100-150 °C as recited in new claim (claim 17). Regarding the limitation of heating being performed at a reduced pressure as recited in claims 18-19 (see translation, page 4, lines 23-24, page 7, lines 1-3). Ikuine further indicates that said modified gum arabic has suppressed discoloration when heated under reduced pressure (as recited in new claims 18-19) and exhibits a superior emulsification power (for example, see translation, page 4, lines 4-5, Page 8, paragraph 0009, lines 3-4, comparative examples, Table 1 and paragraph 17 on page 11) as claimed.

Regarding the limitation of particle size of dried gum arabic as recited in **claim 1** and spray-dried gum arabic in **claim 7**, Whistler Page 228 and Ikuine both disclose that raw material gum arabic is secrete obtained from the trunk of the legume Acacia or species of the same genus and the "raw material gum arabic can be in the form of a commercially available powder, granules or other such gum arabic" (translation, page 5, paragraph 5, lines 13-18). Whistler discloses the limitations of particle size and method of obtaining the powdered gum arabic including "an average particle diameter of not more than 1.5 mm" as disclosed in claim 1 and dried and specifically "spray dried" in claim 7 as a spray dried powder of various grades (sizes), including the spray dried, filtered, heat treated and purified gum Arabic product was known and available (Page 205, last paragraph) at the time of the invention. Further regarding the specific size of the particles of spray dried powders Walter utilizes a spray dried gum arabic in confectionery, where "98% of ...gum arabic will pass through a #80 US Standard sieve"

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(Walter, Column 5, lines 25-30). Further it is noted that a #80 US Standard sieve has an opening of 0.177mm (as evidenced by Particle size conversion reference). Since 98% of gum arabic particles as taught by Walter fall below 0.177 mm, therefore, Walter's average particle diameter for gum arabic will also fall below 0.177mm which overlaps with applicant's recited range of "not more than 1.5 mm". Thus, one of ordinary skill in the art at the time of the invention had knowledge of gum arabic powders that were spray dried and having average particle sizes overlapping the claimed gum arabic particles, as taught by Whistler and Walter. Therefore, it would have been well within the purview of one of ordinary skill in the art at the time of the invention to choose a fine spray-dried powder of dried gum arabic in order to perform the heat treatment under reduced pressure. One of ordinary skill in the art would have been motivated to choose a fine spray dried powder of gum arabic at least a for the purpose of modifying gum arabic powder in a size range which may be most readily dispersible in water with minimum clumping and agglomeration (Whistler page 228, paragraph 4) and also choosing gum arabic to be used in foods, such as, confections with minimal further processing or pretreatment as taught by Walter (Column 2, lines 56-60).

Further, regarding the overlapping of ranges between the invention and prior art composition it is noted that in the case where the claimed ranges "overlap or lie inside the ranges disclosed by the prior art" a prima facie case of obviousness exists (In re Wetheim, 541 F2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)).

Regarding the limitation of "heating gum arabic having a loss-on-drying of not more than 3%" as recited in independent **claim 1**, applicants' disclose loss-on drying as "the term "loss-on-drying" used herein denotes the amount of moisture loss (% by weight) when the target gum arabic is dried by heating at 105°C for 6 hours, and is usually used as an indication of the moisture content of gum arabic, in other words, the dry degree of gum arabic. The fact that gum arabic has a loss-on-drying of not more than 3% denotes that the moisture content of the gum arabic is reduced by not more than 3% by weight when the target gum arabic is dried by heating at 105°C for 6 hours, taking the weight of gum

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arabic before drying by heating as 100% by weight.” (Page 8, Lines 9-25). Further, applicant’s remarks (5/11/2011, page 6, lines 3-9) clarify the significance of term “loss on drying of not more than 3%” as being the property of specific gum arabic utilized as raw material. Thus, the claimed process of heating gum arabic under conditions of temperature and pressure to modify gum arabic in the presence of moisture is not limited to any specific loss of moisture from the gum arabic mixture.

In addition, Ikuine teaches of heating gum arabic in solid state (Translation, page 5, line 3) and is also concerned with prevention of discoloration and enhancing emulsification properties of gum arabic after heat treatment along with loss of moisture and its effect on the emulsification property of the resulting product (for example, see translation Page 5, last 2 lines and page 6, lines 1-4), as claimed. Further, it is noted that heat treatment temperature as taught by Ikuine and Whistler overlaps with the recited range of the applicant and Ikuine also use substantially the claimed process conditions including reduced pressure. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that for a given starting material or raw gum arabic having particle size and moisture content, employing the heat treatment under reduced pressure by the method taught by Ikuine will yield loss-on-drying of gum arabic in the range that will be similar to loss-on-drying of gum arabic product as instantly claimed. Further, applicants are reminded that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Since Ikuine discloses a loss on drying of 15% or less from heat treatment as claimed (translation, page 5, paragraph 5, lines 11-13), which overlaps applicants’ claimed range of a loss-on-drying of 3% or less, one of ordinary skill at the time of the invention

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had knowledge that gum arabic as modified by process of lkuine having low loss on drying characteristic was known and available at the time of the invention for use as a raw material. One of ordinary skill also had knowledge of method of utilizing gum arabic to make a solution and to heat such a solution of gum arabic for known benefits of making low viscosity gum arabic solutions, deactivating enzymes or merely to increase the solubility of gum arabic in water (i.e., the reasons outlined by Whistler) in order to improve the solubility and emulsification property of gum arabic solution. Thus, applicant's recited limitations and process steps were known and routinely utilized to achieve desired benefits at the time of the invention.

Regarding the overlapping of ranges between the invention and prior art composition it is noted that in the case where the claimed ranges "overlap or lie inside the ranges disclosed by the prior art" a prima facie case of obviousness exists (In re Wetheim, 541 F2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)).

Response to Arguments

Applicant's arguments filed May 11, 2011 have been fully considered but are but are not persuasive.

i) Applicants' remarks and affidavit regarding the process steps have been considered but have not been found persuasive. Applicant's main argument is that the product as taught by JP reference 2000-166489 A to lkuine does not have similar loss on drying as instantly claimed. Applicants further provided evidence by way of a new declaration by Mr. Katayama, which highlights the emulsifying ability and discoloration in gum arabic samples with average particle sizes of 1.5 mm or less exhibit less discoloration and increased emulsification ability as compared to large particle size gum arabic wherein the gum arabic is heated to 125°C for 3,6 and 12 hours at reduced pressure (See Page 2 and pages 4-6 of declaration). However, claims 1, 7-9 recite a range of temperature from 90-180 °C, and the declaration shows evidence for a specific temperature value 125 °C. Further the rejected claims also do not recite any specific

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time period for the heat treatment, thus, Declaration of Mr. Katayama provides results of experiments that focus on one specific temperature and thus differ in scope from the invention as claimed and is therefore not persuasive.

ii) Regarding previously submitted declaration and Tables 1-4 as presented as attachments to the Declaration, and applicants' remarks of pages 4-5 addressing the same have been considered. The tables 1-2 and table 4 highlight heating at 125 °C for different periods of time under reduced and normal pressure, which is only part of the claimed temperature range. Table 3 shows results of heating under reduced pressure at 90C for 0.5 hour and subsequently heating at 125 °C under normal pressure conditions, which differs in scope from the invention as claimed because the claims recite heating under reduced pressure. Claims 1 and 8, recite heating gum arabic particles having average size of 1.5 mm or less wherein the heating temperature ranges from 90-180 °C and heating is performed under reduced pressure, where discoloration is suppressed and emulsification ability is increased.

iii) The arguments presented by the applicants' have been considered but are not persuasive as Further in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's claim of unexpected results (Page 8) it is noted that applicant has chosen to utilize a specific gum arabic as raw material (wherein the raw material has a loss-on drying of less than 3%) and formed a solution utilizing such a gum and upon heating such a solution of gum arabic followed by drying such gum arabic to obtain dried gum arabic powder with improved emulsifiability and no discoloration, applicant is referred to rejection above where Ikuine translation, page 4, line 3 where Ikuine teaches of heating gum arabic in solid state, i.e., dried or undissolved state,

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wherein the gum arabic is heated at a temperature of 60°C to 140°C (for example, see translation, page 4, lines 10-14) and at reduced pressure in a gas, preferably inert gas to prevent discoloration (see translation, page 4, lines 23-24, page 7, lines 1-3). Ikuine discloses that "gum arabic can be in the form of a commercially available powder, granules or other such gum arabic" (translation, page 5, paragraph 5, lines 13-18), i.e., Ikuine discloses a method of obtaining gum arabic wherein the loss-on-drying overlaps the claimed range. Further primary reference to Whistler teaches dried gum arabic particles in the claimed range (Page 228) and additional reference to Walter has been relied on to show the conventionality of spray dried gum arabic in where average particle size is below 0.177 mm, i.e., particle size in the claimed range (Walter, Column 5, lines 25-30). Thus, one of ordinary skill in the art at the time of the invention had knowledge of gum arabic powders that were spray dried and having average particle sizes overlapping the claimed gum arabic particles, as taught by Whistler and Walter.

Therefore, one of ordinary skill in the art at the time of the invention had knowledge and availability of gum arabic having low loss-on-drying value.

Further, applicants are reminded that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Further to choose a specific type of gum arabic as raw material to make a solution of gum arabic and heat such a solution within the temperature parameters as claimed followed by spray drying to create the spray dried powder of gum arabic as claimed was well known at the time of the invention. Further, one of ordinary skill at the time of the invention also had the knowledge that heating gum arabic at temperatures of about 80-

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100 °C deactivates enzymes (Page 229, Whistler) and prolonged heating at about 98 yields low viscosity gum arabic on drying (Page 214, last paragraph) and that heating above 140 °C causes discoloration and emulsifying ability does not show an increase when gum arabic is heated below 60 °C (Ikuine, Translation, page 6, Para 6, last 4 lines). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that for a given starting material or raw gum arabic having particle size and moisture content, employing the heat treatment where the temperature range overlaps the claimed range. One of ordinary skill in the art would have been motivated to modify any gum arabic raw material further by heating the gum arabic in solution within the claimed temperature range to achieve known benefits of deactivating the oxidase and peroxidase enzymes without affecting the emulsifying ability (Pages 233-234), denaturing proteins to achieve a reduced viscosity gum arabic product (214) or for the purpose of increasing solubility of gum arabic in water (227). Further regarding the claimed particle size Whistler discloses dried gum arabic particles having particle size 40/100 mesh size which falls in the claimed range and one of ordinary skill in the art at the time of the invention would have been motivated to dry modified gum arabic as spray dried powder with particles in the claimed range at least a for the purpose of modifying gum arabic powder in a size range which may be readily dispersible with minimal clumping or agglomeration (Page 228, whistler) and readily usable in foods, such as confections with minimal further processing or pretreatment as taught by Walter (Column 2, lines 56-60, Walter).

Thus, applicant's claimed results of spray dried gum arabic powder obtained by claimed method are not unexpected.

iv) Regarding no discoloration argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., caking as well as browning stated in remarks, page 9, lines 4-5, no specific reduced pressure conditions and no specific time period for heating (as evidenced by declaration) are not recited in the rejected claim(s). Although the claims are interpreted

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in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JYOTI CHAWLA whose telephone number is (571)272-8212. The examiner can normally be reached on 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JYOTI CHAWLA/
Examiner, Art Unit 1781